

## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY



(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference SS-21261-PCT	FOR FURTHER ACTION		See Form PCT/IPEA/416
International application No. <b>PCT/KR2005/000357</b>	International filing date( <i>day/month/year</i> ) <b>05 FEBRUARY 2005 (05.02.2005)</b>	Priority date ( <i>day/month/year</i> ) 17 FEBRUARY 2004 (17.02.2004)	
International Patent Classification (IPC) or national classification and IPC  <b>H01L 29/78(2006.01)i, H01L 21/335(2006.01)i, H01L 21/336(2006.01)i</b>			
Applicant  <b>SAMSUNG ELECTRONICS CO., LTD. et al</b>			

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 4 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
  - a. ☐ (sent to the applicant and to the International Bureau) a total of \_\_\_\_\_ sheets, as follows:
    - ☐ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
    - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
  - b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) \_\_\_\_\_ containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:
  - ☒ Box No. I Basis of the report
  - ☐ Box No. II Priority
  - ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
  - ☐ Box No. IV Lack of unity of invention
  - ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
  - ☐ Box No. VI Certain documents cited
  - ☐ Box No. VII Certain defects in the international application
  - ☐ Box No. VIII Certain observations on the international application

Date of submission of the demand  <b>15 SEPTEMBER 2005 (15.09.2005)</b>	Date of completion of this report  25 MAY 2006 (25.05.2006)
Name and mailing address of the IPEA/KR  Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer  KIM, Keun Mo  Telephone No. 82-42-481-5985 

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/KR2005/000357

## Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

- ☐ This report is based on translations from the original language into the following language \_\_\_\_\_ which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
  - ☐ publication of the international application (under Rule 12.4)
  - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the **elements** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

- ☒ the international application as originally filed/furnished
- ☐ the description:  
pages \_\_\_\_\_ as originally filed/furnished  
pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_  
pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ the claims:  
pages \_\_\_\_\_ as originally filed/furnished  
pages\* \_\_\_\_\_ as amended (together with any statement) under Article 19  
pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_  
pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ the drawings:  
pages \_\_\_\_\_ as originally filed/furnished  
pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_  
pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ the sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. Statement**

Novelty (N)	Claims	<u>1-37</u>	<u>YES</u>
	Claims	<u>NONE</u>	<u>NO</u>
Inventive step (IS)	Claims	<u>1-37</u>	<u>YES</u>
	Claims	<u>NONE</u>	<u>NO</u>
Industrial applicability (IA)	Claims	<u>1-37</u>	<u>YES</u>
	Claims	<u>NONE</u>	<u>NO</u>

**2. Citations and explanations (Rule 70.7)****1) Reference is made to the following documents:**

D1 : US 2004/0026736 A1                      D2 : JP 2003-197916 A  
D3 : US 6413802 B1                          D4 : US 2004/0036126 A1  
D5 : KR 2004-75566 A

**2) Novelty and Inventive Step**

The present application is related to a semiconductor device comprising : a first active region comprising a plurality of slabs formed on a substrate, each slab having a first surface, a second surface facing a direction opposite to the first surface, and a top surface: a second active region contacting at least one end of the slabs on the substrate to connect one another; a gate line on the first surface, the second surface and the top surface of each of the slabs; and a gate dielectric layer interposed between the slabs and the gate line (claims 1-18) and a manufacturing method thereof (claims 19-37).

Each of documents mentioned in 1) discloses semiconductor devices having multi gates. But, none of the documents D1 to D5 discloses a semiconductor device in which a second active region(140a) contacting at least one end of the slabs on the substrate to connect one another is formed.

By dividing the active region into a first and a second active regions in which the second active region is formed to connect each other of the slabs, a rounding phenomenon or a 'not open' phenomenon can be avoided in this invention.

As mentioned above, it is considered that D1-D5 are to be little relevant to the

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**Supplemental Box**

In case the space in any of the preceding boxes is not sufficient.  
Continuation of:

BOX V

Compared with the prior art as cited in the International Search Report, the present invention(claims 1-37) is believed to be novel and to involve an inventive step under PCT Article 33(2) and 33(3).

3) Industrial Applicability

And the present invention has industrial applicability under PCT Article 33(4).